

A English

CC 78-9. (Inorganic Chemicals and Reactions)

AB The chemical stability of fluoronanotubes in selected solid inorg. matrixes was studied by initially mixing and mech. grinding the components and subsequently heating them at 35-600°. The inorg. compds. selected for matrixes included halides (KBr, KI, LiI, LiBr, LiCl, NaCl, ZnI₂), oxides (Li₂O, Fe₂O₃, PbO, MnO), lithium peroxide (Li₂O₂), potassium superoxide (KO₂), sulfides (Li₂S and ZnS), zinc selenide (ZnSe), **lithium nitride** (Li₃N), and aluminum phosphide (AlP).

Solid products, resulting from the proceeding chemical reactions, were analyzed by x-ray diffraction, Raman spectroscopy, and SEM/EDX elemental anal. Gaseous and volatile products were identified with the help of the TGA/MS technique. Exptl. data presented in this paper provide clear evidence that fluoronanotubes are not chemical inert toward the solid matrixes studied and exhibit significant oxidative properties in the redox reactions occurring under various temps., depending on the nature of the inorg. compound

ST fluorinated carbon nanotube prepn reactivity inorg matrix; fluoronanotube prepn reactivity inorg matrix

IT Nanotubes

(carbon, fluorinated; preparation and oxidative properties and chemical stability of fluoronanotubes in matrixes of binary inorg. compds.)

IT 7440-44-ODP, Carbon, fluorinated

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(nanotubes; preparation and oxidative properties and chemical stability of fluoronanotubes in matrixes of binary inorg. compds.)

IT 1309-37-1, Ferric oxide, reactions 1314-98-3, Zinc sulfide (ZnS), reactions 1315-09-9, Zinc selenide (ZnSe) 1317-36-8, Lead oxide (PbO), reactions 1344-43-0, Manganous oxide, reactions 7447-41-8, Lithium chloride (LiCl), reactions 7550-35-8, Lithium bromide (LiBr) 7647-14-5, Sodium chloride (NaCl), reactions 7681-11-0, Potassium iodide (KI), reactions 7758-02-3, Potassium bromide (KBr), reactions 10139-47-6, Zinc iodide (ZnI₂) 10377-51-2, Lithium iodide (LiI) 12030-88-5, Potassium superoxide 12031-80-0, Lithium peroxide Li₂(O₂) 12057-24-8, Lithium oxide (Li₂O), reactions 12136-58-2, Lithium sulfide (Li₂S) 20859-73-8, Aluminum phosphide (AlP) 26134-62-3, **Lithium nitride** (Li₃N)

RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)

(preparation and oxidative properties and chemical stability of

fluoronanotubes

in matrixes of binary inorg. compds.)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Bettinger, H; J Am Chem Soc 2001, V123, P12849 CA
- (2) Boul, P; Chem Phys Lett 1999, V310, P367 CA
- (3) Chiang, I; J Phys Chem B 2001, V105, P8297 CA
- (4) Chiang, I; PhD Thesis, Rice University 2001
- (5) Gakh, A; Tetrahedron Lett 1993, V34, P7167 CA
- (6) Joint Committee on Powder Diffraction Standards; Powder Diffraction File, Set 16-19 1974, PP455
- (7) Khabashesku, V; Acc Chem Res 2002, V35, P1087 CA
- (8) Khabashesku, V; J Phys Chem B 2002, V106, P11155 CA
- (9) Kniaz, K; J Am Chem Soc 1993, V115, P6060 CA
- (10) Lide, D; Handbook of Chemistry and Physics, 80th ed 1999
- (11) Mickelson, E; Chem Phys Lett 1998, V296, P188 CA
- (12) Mickelson, E; J Fluor Chem 1998, V92, P59 CA
- (13) Mickelson, E; J Phys Chem B 1999, V103, P4318 CA
- (14) Nikolaev, P; Chem Phys Lett 1999, V313, P91 CA
- (15) Peng, H; NanoLetters 2001, V1, P625 CA
- (16) Sugano, M; Chem Phys Lett 1998, V292, P575 CA

L6 ANSWER 2 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 138:278009 CA
 ED Entered STN: 24 Apr 2003
 TI Post-growth p-type doping enhancement for **ZnSe**-based lasers
 using a Li₃N interlayer
 AU Schulz, Oliver; Strassburg, Matthias; Rissom, Thorsten; Pohl, Udo W.;
 Bimberg, Dieter; Klude, Matthias; Hommel, Detlef
 CS Institut fur Festkorperphysik, Technische Universitat Berlin, Berlin,
 10623, Germany
 SO Applied Physics Letters (2002), 81(26), 4916-4918
 CODEN: APPLAB; ISSN: 0003-6951
 PB American Institute of Physics
 DT Journal
 LA English
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)
 Section cross-reference(s): 76
 AB A method to increase decisively the p-type doping level in **ZnSe**
 -based laser diodes is described. Upon Li₃N indiffusion, the formation of
 a stable acceptor complex is observed. Free hole concns. of 8×10^{18}
 cm⁻³ are obtained. This value is at least 1 order of magnitude larger
 than typical p-type doping levels achieved by MBE of **ZnSe**. No
 compensation effects occur, as usually observed for p-type doping using
 either Li or N. **ZnSe**-based lasers processed by applying this
 post-growth p-doping enhancement technol. show significantly improved
 properties.
 ST laser zinc selenide telluride doping **lithium nitride**
 interlayer MBE; magnesium zinc selenide sulfide waveguide laser doping
lithium nitride; capacitance voltage laser zinc selenide
 telluride doping **lithium nitride**; Hall effect laser
 zinc selenide telluride doping **lithium nitride**;
 diffusion doping **lithium nitride** interlayer laser zinc
 selenide telluride
 IT Waveguides
 (laser; post-growth p-type doping enhancement for **ZnSe**-based
 lasers using Li₃N interlayer)
 IT Doping
 Semiconductor lasers
 (post-growth p-type doping enhancement for **ZnSe**-based lasers
 using Li₃N interlayer)
 IT Diffusion
 (post-growth p-type doping enhancement for **ZnSe**-based lasers
 using Li₃N interlayer and)
 IT Electron acceptors
 (post-growth p-type doping enhancement using Li₃N interlayer for
ZnSe-based lasers containing)
 IT Molecular beam epitaxy
 (post-growth p-type doping enhancement using Li₃N interlayer for
ZnSe-based lasers from)
 IT Electric capacitance-potential relationship
 Hall effect
 (post-growth p-type doping enhancement using Li₃N interlayer for
ZnSe-based lasers with)
 IT Lasers
 (waveguide; post-growth p-type doping enhancement for **ZnSe**
 -based lasers using Li₃N interlayer)
 IT 1315-09-9, Zinc selenide (**ZnSe**) 26134-62-3, **Lithium**
nitride (Li₃N)
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PYP (Physical process); PROC (Process); USES (Uses)
 (post-growth p-type doping enhancement for **ZnSe**-based lasers
 using Li₃N interlayer)
 IT 17778-88-0, Nitrogen atom, uses
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)

(post-growth p-type doping enhancement using Li3N interlayer for ZnSe-based lasers containing)

IT 1315-11-3, Zinc telluride 59989-74-1, Zinc selenide sulfide
205578-60-5, Magnesium zinc selenide sulfide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(post-growth p-type doping enhancement using Li3N interlayer for ZnSe-based lasers containing)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

- (1) Fan, Y; Appl Phys Lett 1992, V61, P3160 CA
- (2) Faschinger, W; J Cryst Growth 1999, V197, P557 CA
- (3) Haase, M; Appl Phys Lett 1991, V59, P1272 CA
- (4) Haase, M; J Appl Phys 1990, V67, P448 CA
- (5) Hiei, F; Electron Lett 1993, V29, P878 CA
- (6) Katayama-Yoshida, H; Phys Status Solidi B 1997, V202, P763 CA
- (7) Kato, E; Electron Lett 1998, V34, P282 CA
- (8) Klude, M; Phys Status Solidi B 2002, V229, P935 CA
- (9) Koide, Y; J Appl Phys 1997, V82, P2393 CA
- (10) Kuttler, M; Appl Phys Lett 1997, V71, P243 CA
- (11) Lim, S; Appl Phys Lett 1994, V65, P2437 CA
- (12) Marfaing, Y; Phys Status Solidi B 2002, V229, P229 CA
- (13) Neumark, G; Phys Rev Lett 1989, V62, P1800 CA
- (14) Ohkawa, K; J Cryst Growth 1991, V111, P797 CA
- (15) Park, R; Appl Phys Lett 1990, V57, P2127 CA
- (16) Strassburg, M; EP 00/11488 CA
- (17) Strassburg, M; DE 19955280 C1 1999 CA
- (18) Strassburg, M; IEEE J Sel Top Quantum Electron 2001, V7, P371 CA
- (19) Yasuda, T; Appl Phys Lett 1988, V52, P57 CA

L6 ANSWER 3 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 137:81060 CA

ED Entered STN: 01 Aug 2002

TI Process for preparation of boron nitride nanometer particles

IN Cui, Deliang; Hao, Xiaopeng; Xu, Xiangang; Jiang, Minhua

PA Shandong Univ., Peop. Rep. China

SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 10 pp.

CODEN: CNXXEV

DT Patent

LA Chinese

IC ICM C01B035-14

ICS C04B035-583

CC 49-5 (Industrial Inorganic Chemicals)

Section cross-reference(s): 51, 57

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1323738	A	20011128	CN 2001-115125	20010710
	CN 1101337	B	20030212		
PRAI	CN 2001-115125		20010710		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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CN 1323738	ICM	C01B035-14
	ICS	C04B035-583

AB The process comprises: (1) dissolving B source into organic solvent under stirring for 10-80 min to obtain 0.01-10 M solution; (2) adding slowly N source under stirring; (3) stirring for 0.5-5 h, reacting at 50-600° for 3-120 h in a sealed reaction container (or at 50-300° for 5-120 h in an uncovered container under inert gases atmospheric); (4) extracting with organic solvent (temperature 30-200°) for 1-8 times, and then extracting with deionized water to pH = 7; (5) and vacuum drying (or drying under inert gases atmospheric) to obtain BN nanometer particles.

Hexagonal BN (hBN) nanometer particles are obtained after vacuum drying at 40-80°. Cubic BN (cBN) nanometer particles are prepared by adding 0.01-200 g/L crystalline grains for inducing the growth of cBN in step (3), and removing the crystalline grains by acid or alkali in step (4); the crystalline grains are selected from metal, II-VI semiconductor, III-V semiconductor, oxide semiconductor, or salt with cubic crystal structure and lattice parameters similar to that of cBN. The organic solvent is selected from arenes, alkanes, pyridines, ethers, or esters with high b.p. The B source is selected from boron halides, boranes, or organic borides. The N source is selected from metal nitrides, NH₃, organic amines, or N-containing organic compds.

- ST boron nitride nanometer particle prepn; hexagonal boron nitride nanometer particle prepn; cubic boron nitride nanometer particle prepn
- IT Semiconductor materials
 - (Group IIIA element pnictide; preparation of boron nitride nanometer particles)
- IT Group IIIA element compounds
 - Halides
 - RL: RCT (Reactant); RACT (Reactant or reagent)
 - (boron halides; preparation of boron nitride nanometer particles)
- IT Organic compounds, reactions
 - RL: RCT (Reactant); RACT (Reactant or reagent)
 - (nitrogen-containing; preparation of boron nitride nanometer particles)
- IT Solvents
 - (organic; preparation of boron nitride nanometer particles)
- IT Amines, reactions
 - Borides
 - RL: RCT (Reactant); RACT (Reactant or reagent)
 - (organic; preparation of boron nitride nanometer particles)
- IT Esters, uses
 - Ethers, uses
 - Metals, uses
 - RL: NUU (Other use, unclassified); USES (Uses)
 - (preparation of boron nitride nanometer particles)
- IT Group IIB element chalcogenides
 - RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
 - (preparation of boron nitride nanometer particles)
- IT Boranes
 - Nitrides
 - RL: RCT (Reactant); RACT (Reactant or reagent)
 - (preparation of boron nitride nanometer particles)
- IT 7727-37-9, Nitrogen, uses
 - RL: NUU (Other use, unclassified); USES (Uses)
 - (controlled atmospheric; preparation of boron nitride nanometer particles)
- IT 10043-11-5P, Boron nitride, preparation
 - RL: IMF (Industrial manufacture); PNU (Preparation, unclassified); PREP
 - (Preparation)
 - (preparation of boron nitride nanometer particles)
- IT 7440-02-0, Nickel, uses
 - RL: NUU (Other use, unclassified); USES (Uses)
 - (preparation of boron nitride nanometer particles)
- IT 12063-98-8, Gallium phosphide, properties
 - RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
 - (preparation of boron nitride nanometer particles)
- IT 75-50-3, Trimethylamine, reactions 110-86-1D, Pyridine, derivs. 7664-41-7, Ammonia, reactions 10294-33-4, Boron tribromide 10294-34-5, Boron trichloride 19287-45-7, Diborane 26134-62-3, **Lithium nitride**
 - RL: RCT (Reactant); RACT (Reactant or reagent)
 - (preparation of boron nitride nanometer particles)
- IT 71-43-2, Benzene, uses 109-66-0, n-Pentane, uses 1330-20-7, Xylene, uses
 - RL: NUU (Other use, unclassified); USES (Uses)
 - (solvent; preparation of boron nitride nanometer particles)

L6 ANSWER 4 OF 11 CA COPYRIGHT 2004 ACS on STN
 AN 136:28739 CA
 ED Entered STN: 03 Jan 2002
 TI A novel approach for improved green-emitting II-VI
 lasers
 AU Strassburg, Matthias; Schulz, Oliver; Pohl, Udo W.; Bimberg, Dieter; Itoh,
 Satoshi; Nakano, Kazushi; Ishibashi, Akira; Klude, Matthias; Hommel,
 Detlef
 CS Institut fur Festkorperphysik, Technische Universitat Berlin, Berlin,
 10623, Germany
 SO IEEE Journal of Selected Topics in Quantum Electronics (2001), 7(2),
 371-375
 CODEN: IJSQEN; ISSN: 1077-260X
 PB Institute of Electrical and Electronics Engineers
 DT Journal
 LA English
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)
 AB New concepts to improve the performance of green-emitting laser diodes,
 based on the ZnSe system, are presented. The benefits of
 implantation-induced disordering (IID) and a novel alloyed contact
 structure are discussed. Using IID, index-guided lasers with low
 thresholds are fabricated. The introduction of Li3N-containing contacts leads
 to an acceptor indiffusion resulting in an increased p-type doping level
 and thereby extremely reduced turn-on voltages, threshold current
 densities, increased wall-plug efficiencies, and extended continuous-wave
 lifetimes.
 ST green emitting diode laser zinc selenide
 IT Disorder
 (implantation-induced; novel approach for improved green-emitting
 II-VI lasers)
 IT Ion implantation
 Quantum well devices
 Semiconductor lasers
 (novel approach for improved green-emitting II-VI
 lasers)
 IT 1315-09-9, Zinc selenide (ZnSe) 26134-62-3, Lithium
 nitride (Li3N) 56780-29-1, Cadmium zinc selenide sulfide
 (CdZnSeS) 158346-21-5, Cadmium zinc selenide
 RL: TEM (Technical or engineered material use); USES (Uses)
 (novel approach for improved green-emitting II-VI
 lasers)
 RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE
 (1) Anon; <http://www.research.ibm.com/ionbeams/SRIM/SRIMLEGL.HTM>
 (2) Bhargawa, R; Properties of Wide Bandgap II-VI Semiconductors 1997, P28
 (3) Buijs, M; J Appl Phys 1996, V79, P578 CA
 (4) Campbell, S; The Science and Engineering of Microelectronic Fabrication
 1996
 (5) Depuydt, J; Appl Phys Lett 1989, V55, P1103 CA
 (6) Fan, Y; Appl Phys Lett 1992, V61, P3160 CA
 (7) Haase, M; Appl Phys Lett 1991, V59, P1272 CA
 (8) Heitz, R; Mat Science Forum 1995, V182-184, P259 CA
 (9) Holonyak, N; IEEE J Quantum Electron 1998, V34, P584
 (10) Honda, T; Jpn J Appl Phys 1996, V35, P3878 CA
 (11) Ishibashi, A; Proc 23rd Int Conf Physics of Semiconductors 1996, V4, P3155
 CA
 (12) Itoh, S; J Cryst Growth 2000, V214-215, P1029
 (13) Itoh, S; Jpn J Appl Phys 1994, V33, P639
 (14) Kato, E; Electron Lett 1998, V34, P282 CA
 (15) Kawasumi, T; Electron Lett 1995, V31, P1667 CA
 (16) Klude, M; J Cryst Growth 2000, V214-215, P1040
 (17) Koide, Y; J Appl Phys 1997, V82, P2393 CA

- (18) Kondo, K; Appl Phys Lett 1994, V64, P3434 CA
- (19) Kuttler, M; Appl Phys Lett 1996, V69, P2647
- (20) Kuttler, M; Appl Phys Lett 1998, V73, P1865 CA
- (21) Law, K; Electron Lett 1996, V32, P345 CA
- (22) Legge, M; IEEE Photon Technol Lett 2000, V12, P236
- (23) Nakayama, N; Electron Lett 1993, V29, P1488 CA
- (24) Ozawa, M; Electron Lett 1993, V29, P503 CA
- (25) Pohl, U; J Cryst Growth 1994, V138, P385 CA
- (26) Schulz, O; Phys Stat Sol (a) 2000, V180, P213 CA
- (27) Strassburg, M; Electron Lett 2000, V36, P44 CA
- (28) Strassburg, M; Thin Solid Films 1998, V336, P208
- (29) Toda, A; Appl Phys Lett 1998, V73, P1523 CA

L6 ANSWER 5 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 134:374899 CA

ED Entered STN: 14 Jun 2001

TI Contact structure for an electric **II**/VI semiconductor component and a method for the production of the same

IN Strassburg, Matthias; Schulz, Oliver; Pohl, Udo W.; Bimberg, Dieter

PA Technische Universitaet Berlin, Germany

SO PCT Int. Appl., 16 pp.

CODEN: PIXXD2

DT Patent

LA German

IC ICM H01S005-042

ICS H01S005-327; H01L033-00; H01L029-45

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 73

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001037385	A1	20010525	WO 2000-EP11488	20001117
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	DE 19955280	C1	20010628	DE 1999-19955280	19991117
	US 6673641	B1	20040106	US 2002-111661	20020424
PRAI	DE 1999-19955280	A	19991117		
	WO 2000-EP11488	W	20001117		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2001037385	ICM	H01S005-042
	ICS	H01S005-327; H01L033-00; H01L029-45
US 6673641	ECLA	H01L021/443; H01L033/00B4B; H01S005/042E; H01S005/327

AB The invention relates to a method for producing contacts for elec. **II**/VI semiconductor structures (e.g. laser diodes in the blue-green spectral region). Said contacts are characterized in that Li nitride is provided between the semiconductor structure and the other contact layers.

ST contact structure elec semiconductor device laser diode **lithium nitride**

IT Electric contacts

Electric insulators

Semiconductor devices

Sputtering

Tempering

(contact structure for elec. **II**/VI semiconductor

component and a method for production of same)

IT Group IIB element chalcogenides
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (contact structure for elec. II/VI semiconductor component and a method for production of same)

IT Semiconductor lasers
 (in the blue-green spectral region; contact structure for elec. II/VI semiconductor component and a method for production of same)

IT Coating process
 (metalization; contact structure for elec. II/VI semiconductor component and a method for production of same)

IT 1315-11-3, Zinc telluride 7440-05-3, Palladium, processes 7440-57-5, Gold, processes 26134-62-3, **Lithium nitride**
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (contact structure for elec. II/VI semiconductor component and a method for production of same)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Honda, T; JAPANESE JOURNAL OF APPLIED PHYSICS, PART 1 1996, V35(7), P3878 CA

(2) Kijima, S; APPLIED PHYSICS LETTERS 1998, V73(2), P235 CA

(3) Murakami, M; US 5786269 A 1998 CA

L6 ANSWER 6 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 128:122118 CA

ED Entered STN: 03 Mar 1998

TI Electrical and optical properties of **ZnSe** epilayers doped with Li and N by thermal diffusion

AU Kim, Jin-Bae; Lee, Wan-Ho

CS Dep. Physics, Chung-ang Univ., Seoul, 156-756, S. Korea

SO Journal of the Korean Physical Society (1997), 31(5), 787-791
 CODEN: JKPSDV; ISSN: 0374-4884

PB Korean Physical Society

DT Journal

LA English

CC 76-2 (Electric Phenomena)
 Section cross-reference(s): 73

AB The authors prepared p-type **ZnSe** epilayers with low resistivity and a high net hole concentration by simple conventional thermal diffusion of Li₃N in undoped **ZnSe** epilayers grown on GaAs (100) substrates by hot-wall epitaxy. The maximum effective hole concentration was 2.3×10^{17} cm⁻³ and the min. resistivity was 1.4 Ω·cm when Li₃N thermally diffused for 3 h at 500°C. An emission line at 2.623 eV dominated the PL spectra of the Li₃N-doped **ZnSe** epilayers. The PL emission spectra dependencies of **ZnSe:Li,N** epilayers on the measurement temperature and the excitation intensity suggested that the emission line at 2.623 eV is due to a transition from conduction band to an acceptor-like extended defect.

ST zinc selenide epilayer doping thermal diffusion; **lithium nitride** doped zinc selenide property; elec property diffusion doped zinc selenide; optical property diffusion doped zinc selenide

IT Dopants
 (Li₃N; elec. and optical properties of **ZnSe** epilayers doped with Li and N by thermal diffusion)

IT Doping
 Electric resistance
 Epitaxial films
 Hole concentration
 Hot wall epitaxy

(elec. and optical properties of **ZnSe** epilayers doped with Li and N by thermal diffusion)

IT Luminescence
(for studies of elec. and optical properties of **ZnSe** epilayers doped with Li and N by thermal diffusion)

IT Diffusion
(thermal; elec. and optical properties of **ZnSe** epilayers doped with Li and N by thermal diffusion)

IT 26134-62-3, **Lithium nitride** (Li₃N)
RL: MOA (Modifier or additive use); USES (Uses)
(elec. and optical properties of **ZnSe** epilayers doped with Li and N by thermal diffusion)

IT 1315-09-9P, Zinc selenide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(elec. and optical properties of **ZnSe** epilayers doped with Li and N by thermal diffusion)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

- (1) Chadi, D; Material Science Forum 1993, V117-118, P61 CA
- (2) Dean, P; Phys Rev 1983, VB27, P2419
- (3) Lee, W; Journal of The Institute for Basic Science 1995, V9, P1
- (4) Qiu, J; Appl Phys Lett 1991, V59, P2992 CA
- (5) Sasaki, T; Phys Rev 1991, VB43, P9362
- (6) Skromme, B; J Korean Phys Soc 1995, V28, PS43
- (7) Stutius, W; Appl Phys Lett 1982, V40, P246 CA
- (8) Yang, Z; Appl Phys Lett 1992, V61, P2671 CA
- (9) Yasuda, T; Appl Phys Lett 1988, V52, P57 CA
- (10) Yoshikawa, A; J Korean Phys Soc 1995, V28, PS32
- (11) Zhu, Z; J Cryst Growth 1992, V117, P400 CA

L6 ANSWER 7 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 126:151130 CA

ED Entered STN: 11 Mar 1997

TI Diode characteristics of Li₃N-diffused **ZnSe** grown by MOVPE

AU Honda, T.; Lim, S. W.; Inoue, K.; Hara, K.; Munekata, H.; Kukimoto, H.; Koyama, F.; Iga, K.

CS Precision and Intelligence Laboratory, Tokyo Institute of Technology, 4259 Nagatsuta, Midori-ku, Yokohama, 226, Japan

SO Journal of Crystal Growth (1997), 170(1-4), 503-506

CODEN: JCRGAE; ISSN: 0022-0248

PB Elsevier

DT Journal

LA English

CC 76-3 (Electric Phenomena)

AB The authors have fabricated a **ZnSe** diode using Li₃N diffusion technique for the purpose of forming p-type **ZnSe**. The maximum hole concentration in the Li₃N-diffused **ZnSe** layer, which was grown on a GaAs substrate by OMVPE, was $\leq 10^{18}$ cm⁻³. The ohmic contact to the p-type **ZnSe** was demonstrated and the specific contact resistance of Au/p-**ZnSe** was $1 + 10^{-2} \Omega \text{ cm}^2$. The Li₃N diffusion technique is useful for the fabrication of ohmic contacts to p-**ZnSe**.

ST **lithium nitride** doped zinc selenide diode

IT Diodes

Electric contacts

Hole (electron)

Metalorganic vapor phase epitaxy

(diode characteristics of Li₃N-diffused **ZnSe** grown by MOVPE)

IT 1315-09-9P, Zinc selenide (**ZnSe**)

RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(diode characteristics of Li₃N-diffused **ZnSe** grown by MOVPE)

IT 26134-62-3, **Lithium nitride** (Li3N)
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (diode characteristics of Li3N-diffused **ZnSe** grown by MOVPE)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE

- (1) Berger, H; Solid State Electron 1972, V15, P145
- (2) Einfeldt, S; J Crystal Growth 1994, V138, P471 CA
- (3) Fan, Y; Appl Phys Lett 1992, V61, P3160 CA
- (4) Fan, Y; Appl Phys Lett 1992, V61, P3160 CA
- (5) Haase, M; Appl Phys Lett 1991, V58, P1173 CA
- (6) Haase, M; Appl Phys Lett 1991, V59, P1272 CA
- (7) Hiei, F; Electron Lett 1993, V29, P878 CA
- (8) Iga, K; IEICE Trans Fundamentals 1992, VE75-A, P12
- (9) Ishibashi, A; IEEE Lasers and Electro-Optics Society 1994 Annual Meeting 1994, PPD1.1
- (10) Kamata, A; J Crystal Growth 1994, V145, P557 CA
- (11) Lim, S; Appl Phys Lett 1994, V65, P2437 CA
- (12) Miyajima, T; Jpn J Appl Phys 1992, V31, PL1743 CA
- (13) Mochizuki, K; Appl Phys Lett 1995, V67, P112 CA
- (14) Yanashima, K; J Crystal Growth 1992, V124, P949
- (15) Yasuda, T; Appl Phys Lett 1988, V52, P181
- (16) Yokogawa, T; Jpn J Appl Phys 1995, V34, PL751 CA

L6 ANSWER 8 OF 11 CA COPYRIGHT 2004 ACS on STN
 AN 125:182299 CA
 ED Entered STN: 25 Sep 1996
 TI Formation of highly conductive p-type **ZnSe** using Li3N
 AU Honda, Tohru; Lim, Sung Wook; Yanashima, Katsunori; Inoue, Kousuke; Hara, Kazuhiko; Munekata, Hiro; Kukimoto, Hiroshi; Koyama, fumio; Iga, Kenichi
 CS Precision and Intelligence Laboratory, Tokyo Institute Technology, Yokohama, 226, Japan
 SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (1996), 35(7), 3878-3879
 CODEN: JAPNDE; ISSN: 0021-4922
 PB Japanese Journal of Applied Physics
 DT Journal
 LA English
 CC 76-1 (Electric Phenomena)
 AB The authors have achieved high concentration p-type doping of **ZnSe** grown by metalorg. vapor phase epitaxy using a Li3N diffusion technique. The average hole concentration in the **ZnSe**:(Li,N) layer formed at a diffusion temperature of 470° was as high as $1 \times 10^{18} \text{ cm}^{-3}$, and the layer exhibited a resistivity of $\rho = 0.3 \Omega \cdot \text{cm}$ and a hole mobility of $\mu_p = 18 \text{ cm}^2/\text{V} \cdot \text{s}$.
 ST VPE conductive zinc selenide
 IT Hole
 (concentration and mobility of,; formation of highly conductive p-type **ZnSe** using Li3N)
 IT Diffusion
 Electric conductors
 Electric resistance
 (formation of highly conductive p-type **ZnSe** using Li3N)
 IT Epitaxy
 (vapor-phase, formation of highly conductive p-type **ZnSe** using Li3N)
 IT 7439-93-2, Lithium, processes 7727-37-9, Nitrogen, processes
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (dopant; formation of highly conductive p-type **ZnSe** using Li3N)
 IT 26134-62-3, **Lithium nitride** (Li3N)
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (formation of highly conductive p-type **ZnSe** using Li3N)
 IT 1315-09-9P, Zinc selenide (**ZnSe**)

RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(formation of highly conductive p-type ZnSe using Li3N)

L6 ANSWER 9 OF 11 CA COPYRIGHT 2004 ACS on STN
AN 123:273686 CA
ED Entered STN: 11 Nov 1995
TI Growing of Group II-VI element compound semiconductor
IN Okuyama, Hiroyuki; Ishibashi, Akira
PA Sony Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-363
ICS H01L021-203; H01S003-18
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 73

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07142514	A2	19950602	JP 1993-314514	19931119
PRAI	JP 1993-314514		19931119		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 07142514	ICM	H01L021-363
	ICS	H01L021-203; H01S003-18

AB In vapor-phase growing of a p-type Group II-VI element compound semiconductor, a compound containing N and ≥ 1 of Na, P, S, Se, Zn, Mg, and Li or a compound containing Na and ≥ 1 of P, S, Se, Zn, and N is used as a p-type dopant. The compound semiconductor may be ZnSe, ZnTe, Zn(S,Se), (Zn,Cd)Se, or (Zn,Mg)(S,Se). The method is suited for manufacture of semiconductor laser capable of emitting light of short wavelength.

ST semiconductor laser Group II VI compd; nitrogen compd
dopant semiconductor laser; sodium compd dopant semiconductor laser

IT Semiconductor materials
(vapor-phase growing of Group II-VI element compound semiconductor containing p-type dopant useful for semiconductor laser for short wavelength)

IT Lasers
(semiconductor, vapor-phase growing of Group II-VI element compound semiconductor containing p-type dopant useful for semiconductor laser for short wavelength)

IT 1313-49-1, Zinc nitride (Zn3N2) 1313-82-2, Sodium sulfide (Na2S), uses
1313-85-5, Sodium selenide (Na2Se) 12033-56-6, Nitrogen sulfide (NS)
12033-57-7, Nitrogen sulfide (NS2) 12033-59-9, Nitrogen selenide (NSe)
12034-40-1, Sodium sulfide (Na2S5) 12057-71-5, Magnesium nitride (Mg3N2)
12136-83-3, Sodium nitride (Na3N) 12136-91-3, Phosphorus nitride (P3N5)
12396-71-3, Sodium zinc sulfide (Na2ZnS2) 12396-73-5, Sodium zinc
sulfide (Na6ZnS4) 14215-28-2, Zinc azide 26134-62-3, Lithium
nitride (Li3N) 26628-22-8, Sodium azide (NaN3) 31411-38-8
61218-87-9, Sodium, compound with zinc (1:13) 72490-22-3, Sodium phosphide
(NaP) 115694-77-4, Sodium sulfide (NaS) 117690-41-2,
1,2,4,3,5-Triseleno(4-SeIV)diazole 127770-69-8, Nitrogen sulfide (N6S5)
137122-35-1, Nitrogen sulfide (N2S3) 164171-45-3, Sodium selenide (NaSe)
168972-96-1 168972-97-2, Sodium sulfide (NaS2) 169447-63-6, Nitrogen
sulfide (NS8) 169447-64-7, Nitrogen sulfide (NS11)

RL: MOA (Modifier or additive use); USES (Uses)

(dopant; vapor-phase growing of Group II-VI element compound semiconductor containing p-type dopant useful for semiconductor laser for short wavelength)

IT 1315-09-9, Zinc selenide 1315-11-3, Zinc telluride 59989-74-1, Zinc
selenide sulfide (Zn(Se,S)) 107874-73-7, Zinc cadmium selenide

((Zn,Cd)Se) 137575-57-6, Magnesium zinc selenide sulfide ((Mg,Zn)(Se,S))
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (vapor-phase growing of Group II-VI element compound semiconductor containing p-type dopant useful for semiconductor laser for short wavelength)

L6 ANSWER 10 OF 11 CA COPYRIGHT 2004 ACS on STN
 AN 122:43602 CA
 ED Entered STN: 21 Jan 1995
 TI High p-type doping of ZnSe using Li3N diffusion
 AU Lim, S. W.; Honda, T.; Koyama, F.; Iga, K.; Inoue, K.; Yanashima, K.; Munekata, H.; Kukimoto, H.
 CS Precision and Intelligence Lab., Tokyo Inst Technol., Yokohama, 227, Japan
 SO Applied Physics Letters (1994), 65(19), 2437-8
 CODEN: APPLAB; ISSN: 0003-6951
 PB American Institute of Physics
 DT Journal
 LA English
 CC 76-2 (Electric Phenomena)
 AB The authors have achieved a highly doped p-type ZnSe layer using a Li3N diffusion technique. The hole concentration of the p-type ZnSe layer, grown on a GaAs substrate by OMVPE, reached a level $\leq 10^{17}$ cm⁻³. With the diffusion temperature of 470°, the resistivity of the layer is ≥ 0.4 cm, with hole concentration $p > 9 \times 10^{17}$ cm⁻³ and hole mobility $\mu_p = 17$ cm²/V s. The authors made an ohmic contact by using this p+-type ZnSe as a contact layer for p-ZnSe epilayers.
 ST zinc selenide doping lithium nitride diffusion
 IT Electric contacts
 (highly doped p-type ZnSe)
 IT Hole
 (hole concentration and mobility in highly doped p-type ZnSe layer)
 IT Electric resistance
 (of highly doped p-type ZnSe layer)
 IT 1315-09-9, Zinc selenide (ZnSe)
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (high p-type doping of ZnSe using Li3N diffusion)
 IT 26134-62-3, Lithium nitride (Li3N)
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (high p-type doping of ZnSe using Li3N diffusion)

L6 ANSWER 11 OF 11 CA COPYRIGHT 2004 ACS on STN
 AN 110:31181 CA
 ED Entered STN: 21 Jan 1989
 TI Light-emitting devices and their fabrication
 IN Kukimoto, Hiroshi; Mitsuishi, Iwao; Yasuda, Takashi
 PA Incubator Japan, Inc., Japan; Misawa Co., Ltd.
 SO Ger. Offen., 7 pp.
 CODEN: GWXXBX
 DT Patent
 LA German
 IC ICM H01L033-00
 ICS H01L021-365
 ICA H01S003-19
 CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 75, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3810245	A1	19881006	DE 1988-3810245	19880325
	JP 63271982	A2	19881109	JP 1987-71567	19870327
	JP 01175778	A2	19890712	JP 1987-335866	19871229

	US 5068204	A	19911126	US 1988-173067	19880325
	FR 2613136	A1	19880930	FR 1988-4025	19880328
	US 5140385	A	19920818	US 1991-639306	19910104
PRAI	JP 1987-71567		19870327		
	JP 1987-238655		19870925		
	JP 1987-335866		19871229		
	US 1988-173067		19880325		
	US 1989-338738		19890414		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 3810245	ICM	H01L033-00
	ICS	H01L021-365
	ICA	H01S003-19
AB	The title devices (e.g., blue-emitting LEDs) incorporate a low-resistivity p-type Group IIB chalcogenide semiconductor film formed on a semiconductor substrate; fabrication of the devices includes vapor-phase deposition of the films while maintaining the ratio of flow rates between the Group IIB and Group VIA materials at 1-100 and introducing Group IA elements or their compds. as dopants. The doping may also be done using Group V elements, and the structure may also include a n-type layer also formed by vapor-phase deposition.	
ST	blue LED fabrication; Group IIB chalcogenide LED fabrication; vapor phase deposition LED fabrication; light emitting device fabrication	
IT	Electroluminescent devices	
	(Group IIB chalcogenide, fabrication of)	
IT	Alkali metals, uses and miscellaneous	
	RL: USES (Uses)	
	(dopants, for Group IIB chalcogenide light-emitting devices)	
IT	Group IIB element chalcogenides	
	RL: PRP (Properties)	
	(vapor-phase deposition of, in light-emitting device fabrication)	
IT	1303-00-0, Gallium arsenide, uses and miscellaneous	
	RL: USES (Uses)	
	(Group IIB chalcogenide film deposition on, in electroluminescent device fabrication)	
IT	7439-93-2, Lithium, uses and miscellaneous 7440-09-7, Potassium, uses and miscellaneous 7440-23-5, Sodium, uses and miscellaneous	
	RL: USES (Uses)	
	(dopant, for Group IIB chalcogenide light-emitting devices)	
IT	75-24-1, Trimethyl aluminum 26134-62-3, Lithium nitride (Li3N)	
	RL: PRP (Properties)	
	(doping by, in Group IIB chalcogenide in light-emitting device fabrication)	
IT	352-93-2, Diethylsulfide 544-97-8, Dimethyl zinc 557-20-0, Diethyl zinc 627-53-2, Diethylselenide	
	RL: PRP (Properties)	
	(in vapor-phase film deposition for Group IIB chalcogenide light-emitting device fabrication)	
IT	1314-98-3, Zinc sulfide(ZnS), uses and miscellaneous 1315-09-9, Zinc selenide(ZnSe)	
	RL: USES (Uses)	
	(vapor-phase deposition of, in light-emitting device fabrication)	
IT	110758-60-6, Zinc selenide sulfide(ZnSe0.92S0.08)	
	RL: PRP (Properties)	
	(vapor-phase deposition of, in light-emitting device fabrication)	

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